

Olio-cerebellar circuit. Structure and functions

62/1.

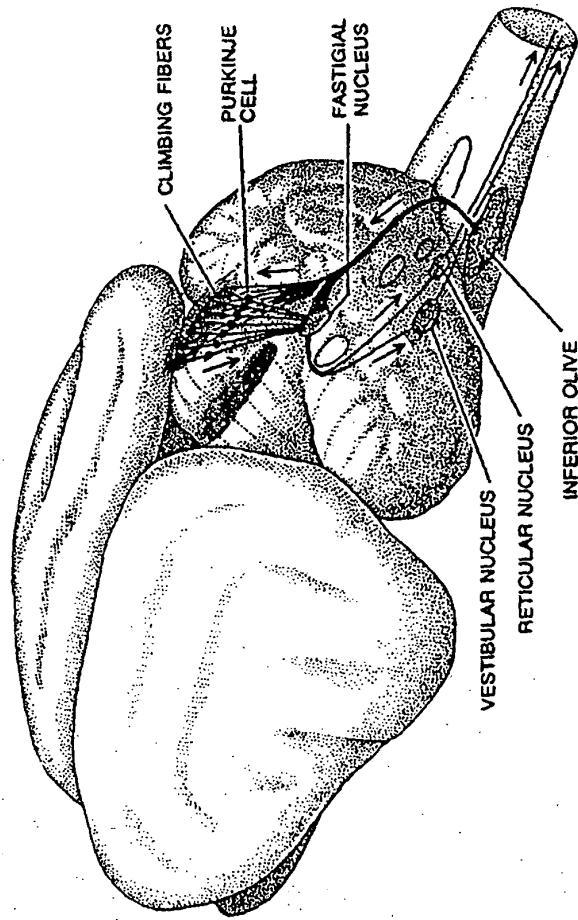


FIG. 1A

Olio-cerebellar feedback loop.

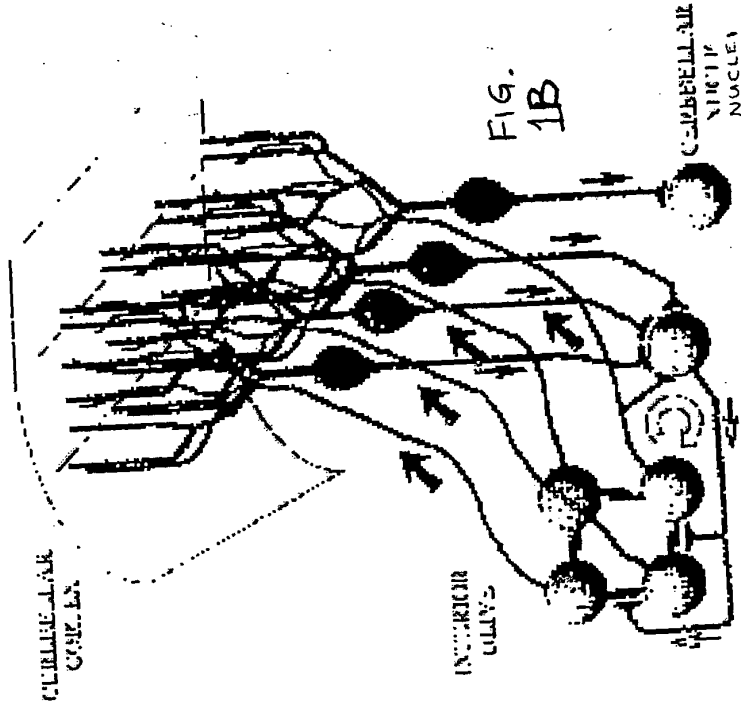


Fig. 1B

Functional circuit.

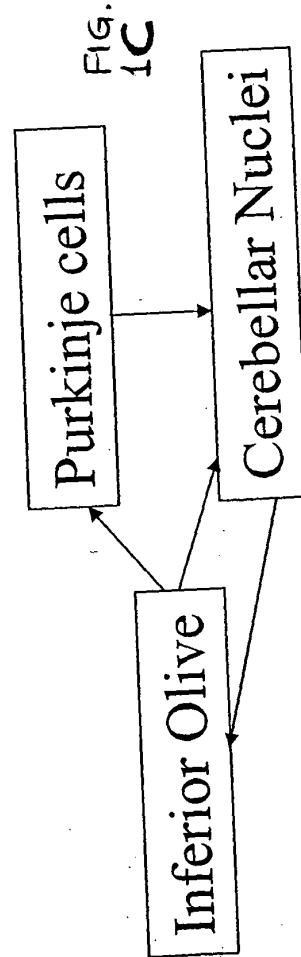
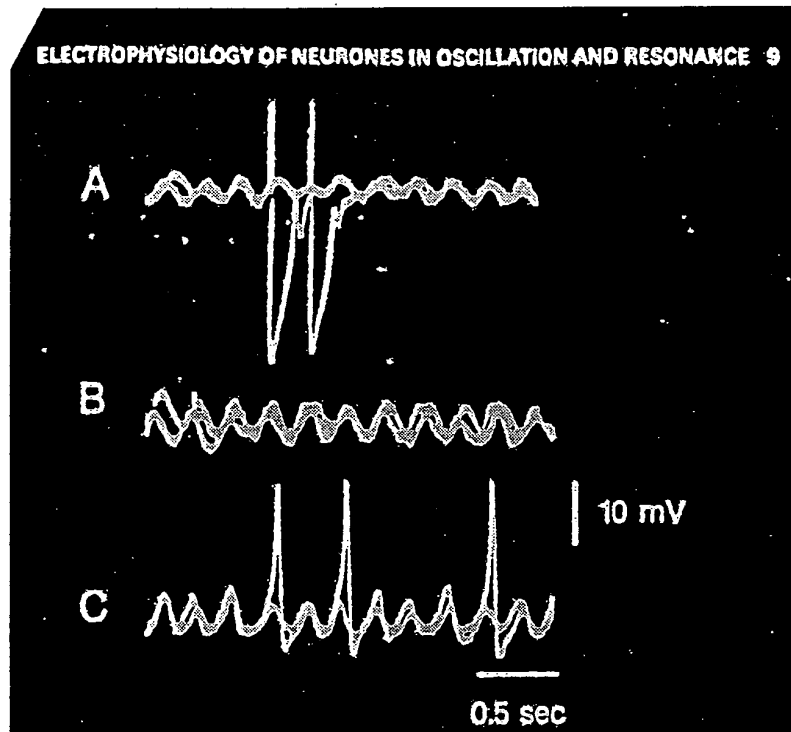


Fig. 1C

FIG. 2



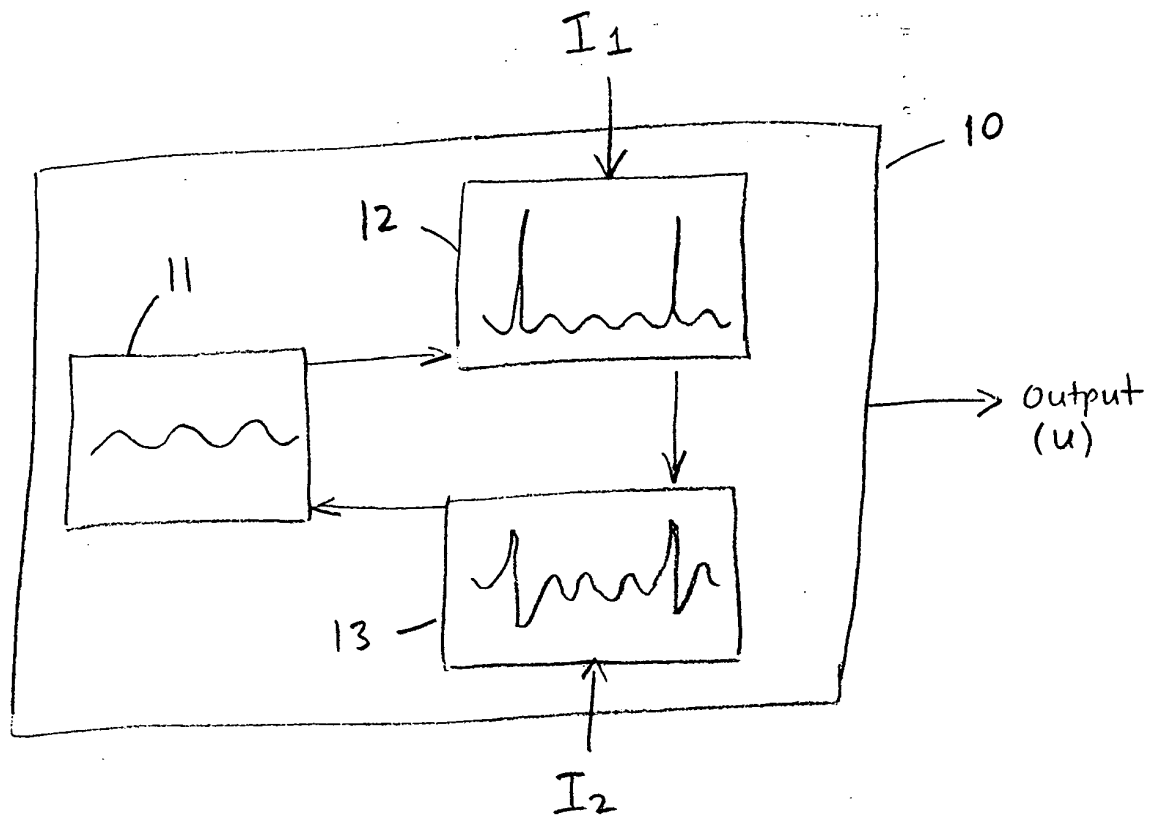


FIG. 3

FIG. 4

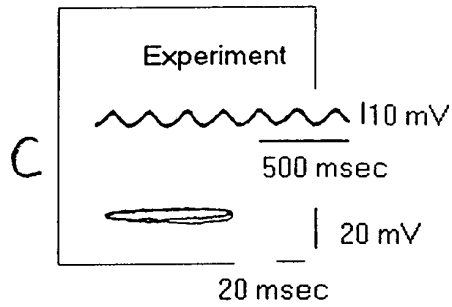
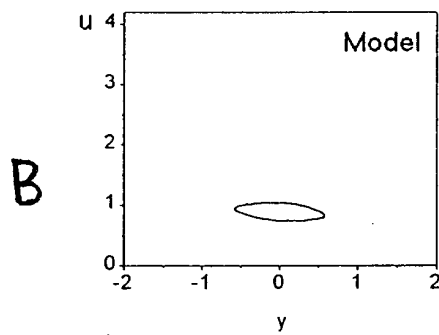
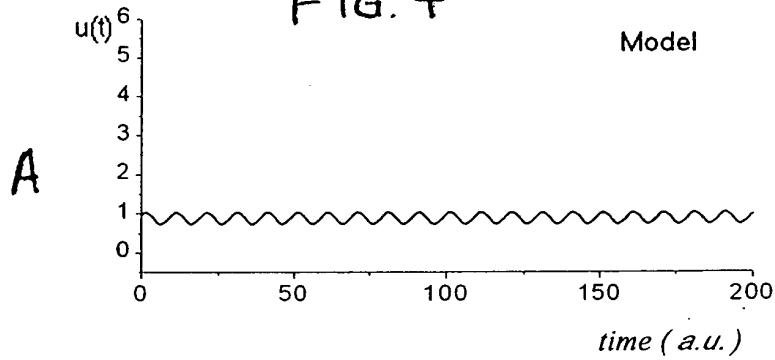


FIG. 5A

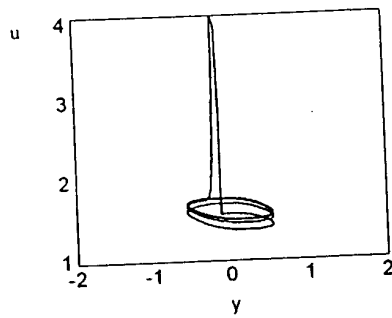
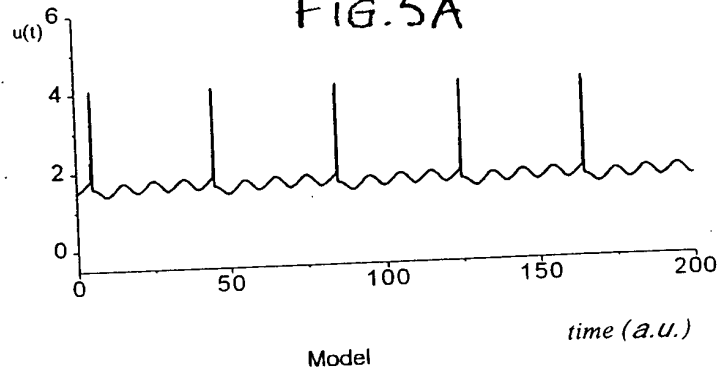


FIG. 5B

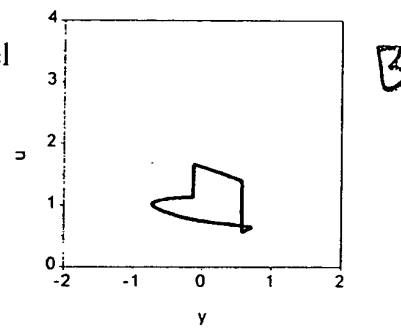
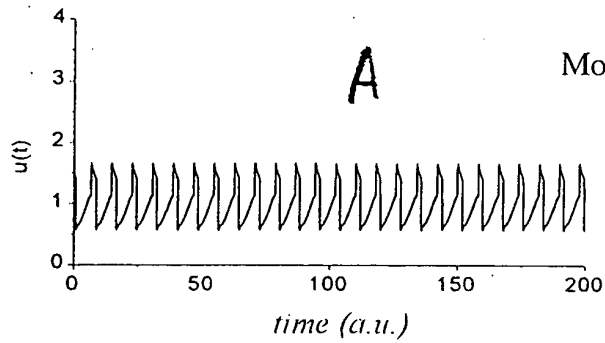


FIG. 6

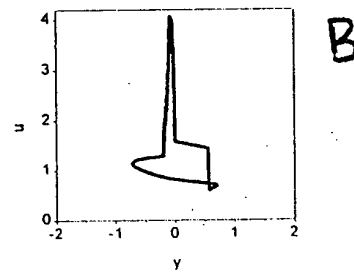
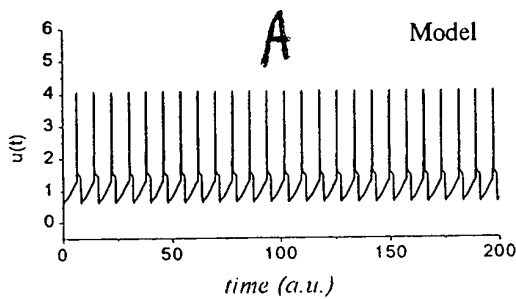
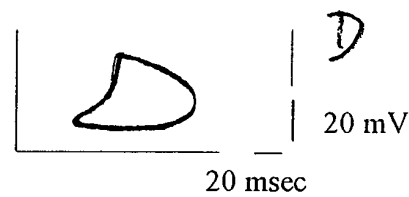
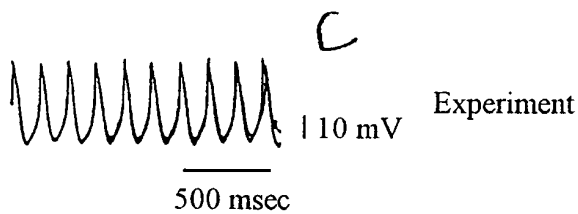
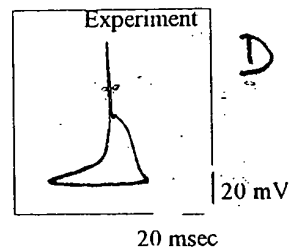
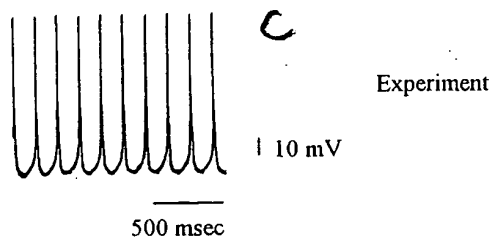
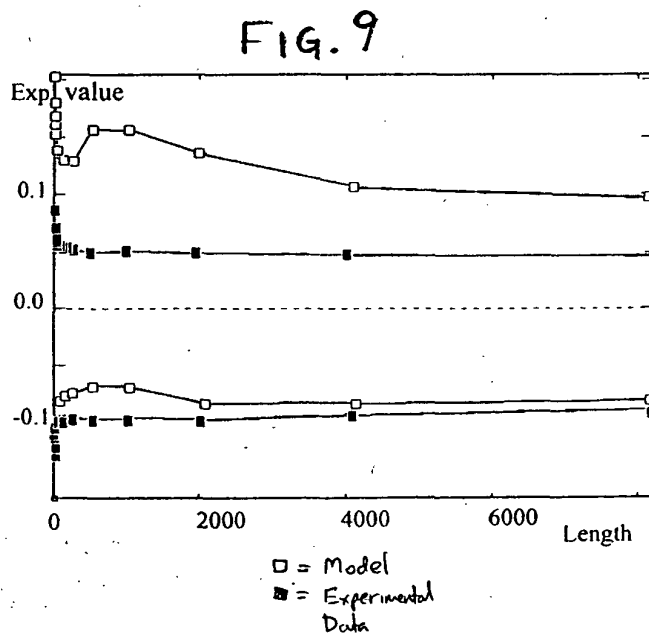
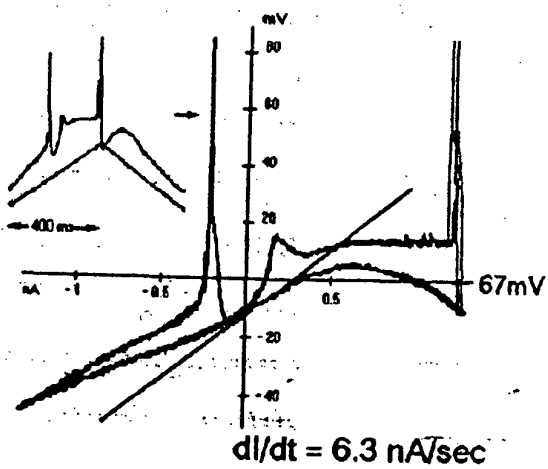
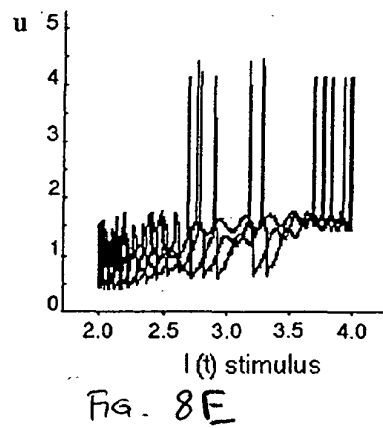
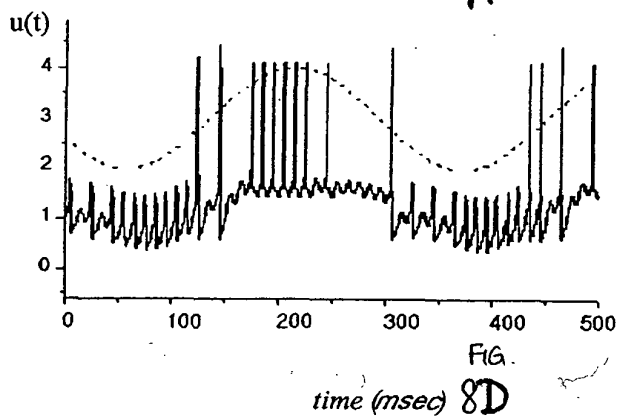
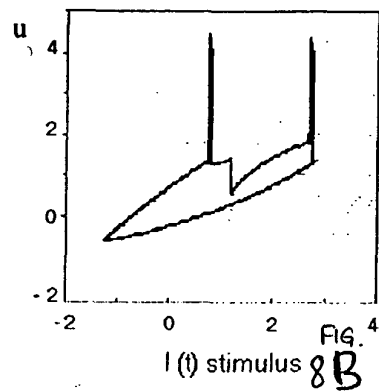
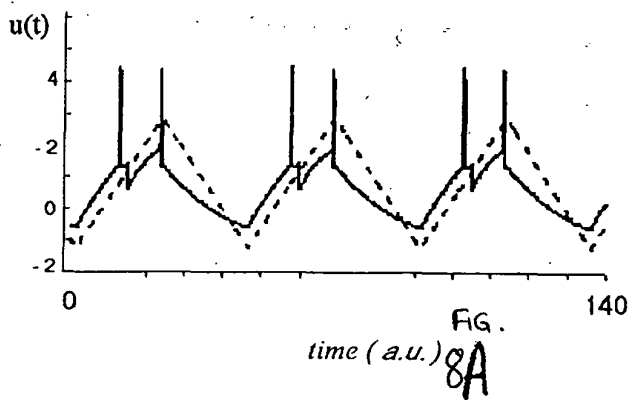


FIG. 7





Block-diagram of the circuit

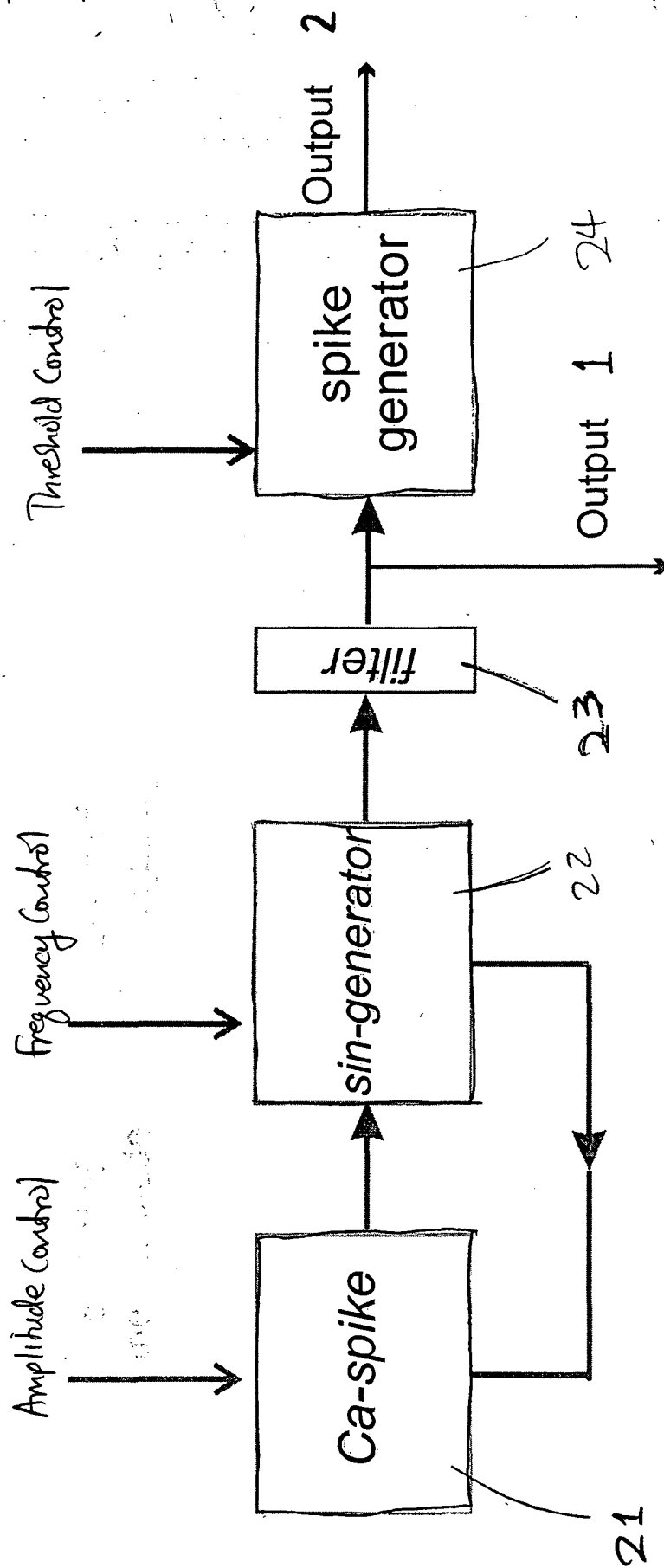


FIG. 10

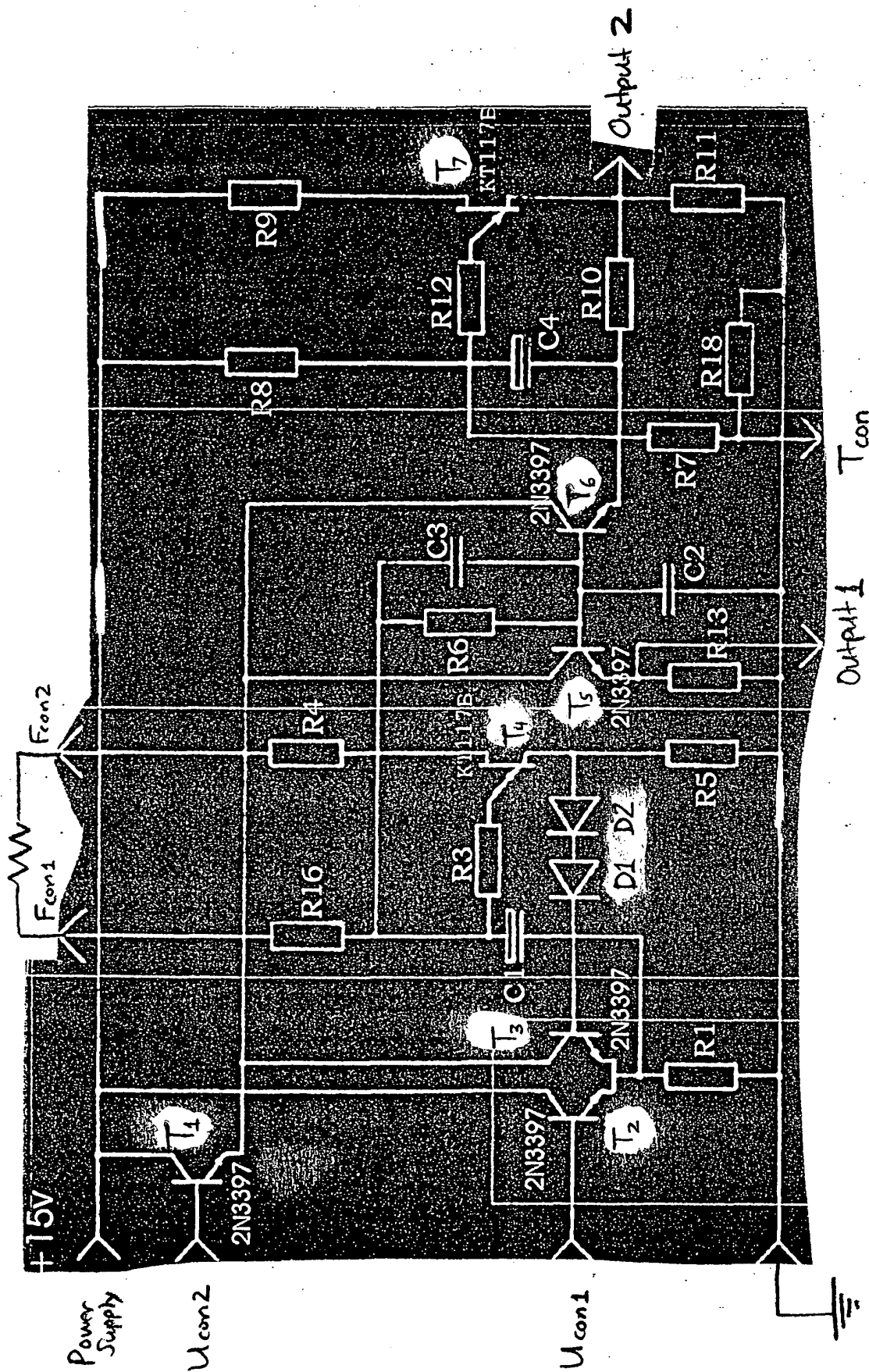


FIG. 11

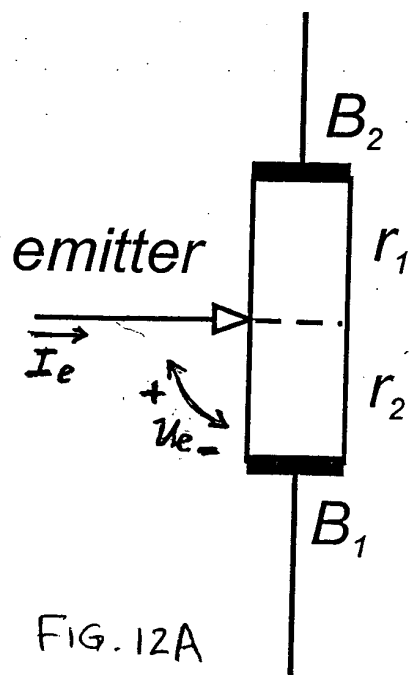


FIG. 12A

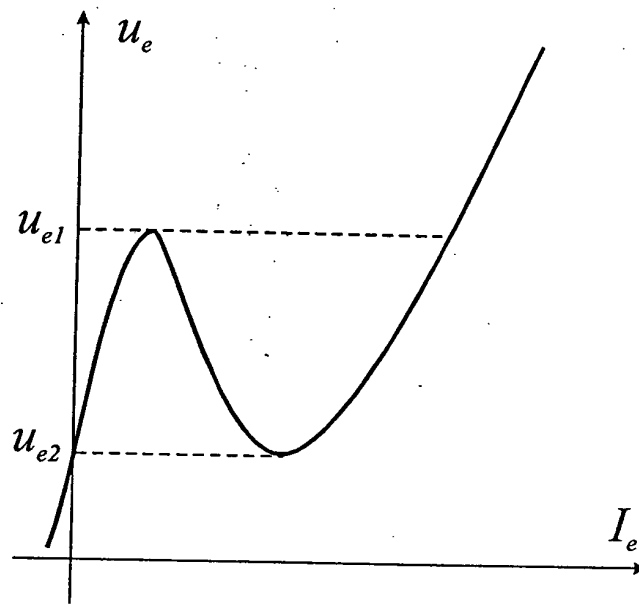
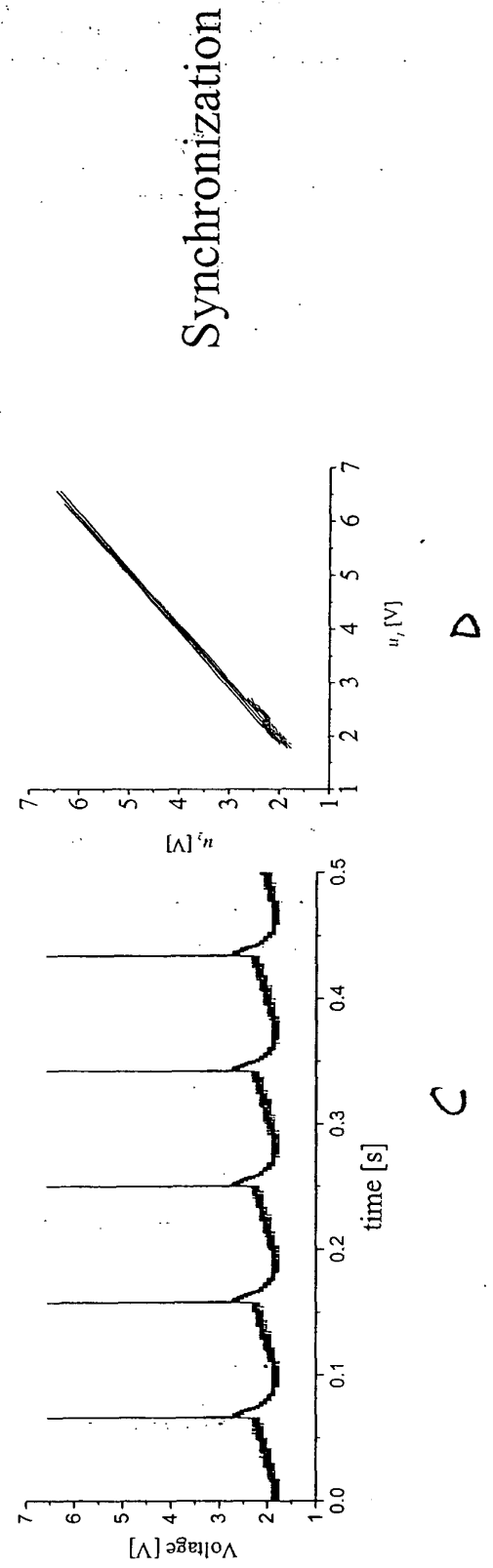
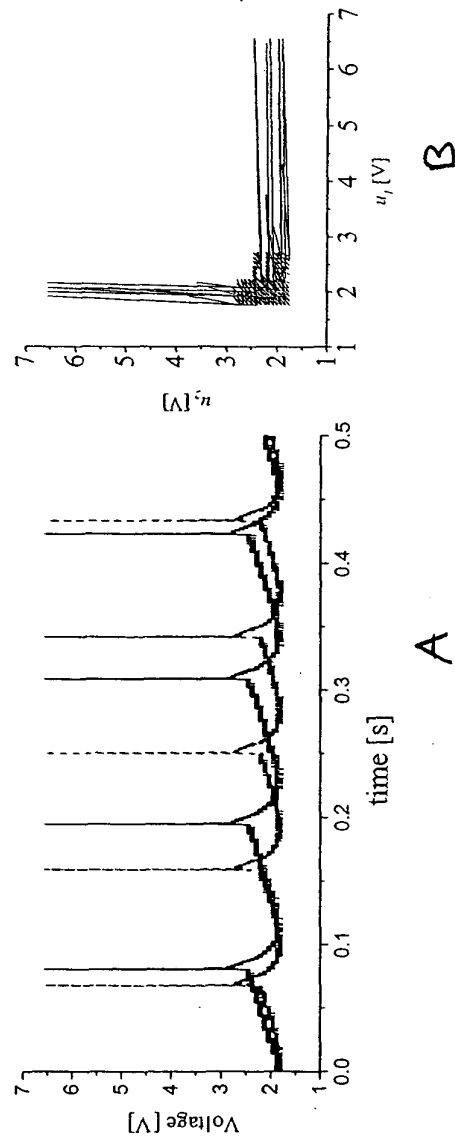


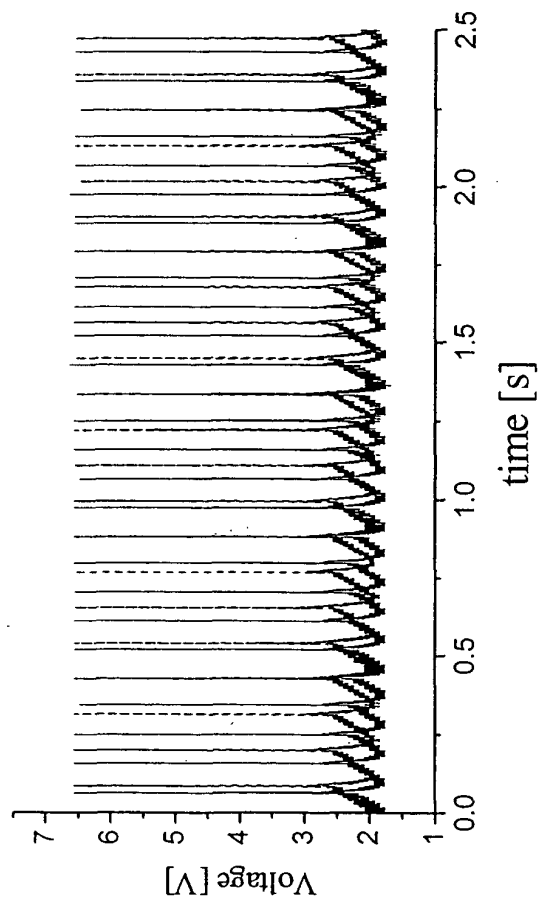
FIG. 12B

FIG. 13

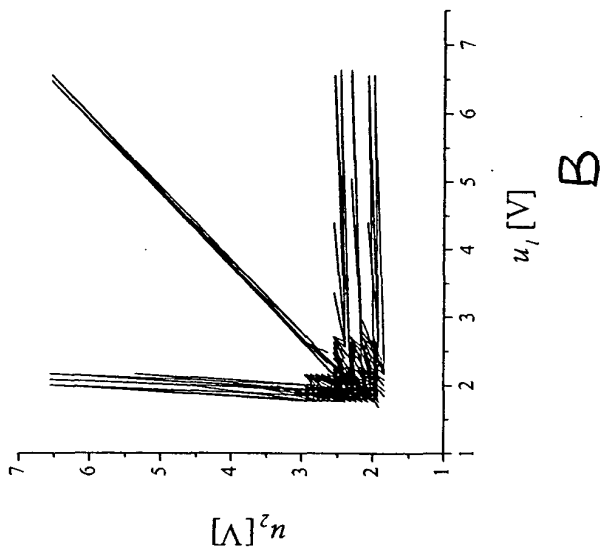
Two chip experiments



Synchronous and asynchronous spiking



A



B

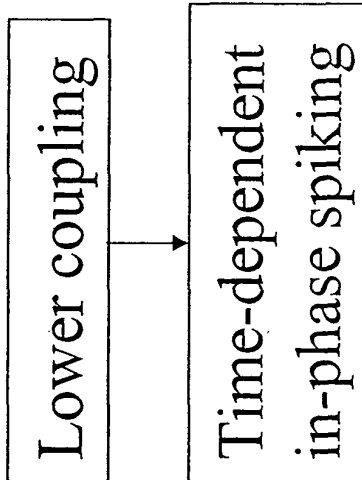


FIG. 14

1000

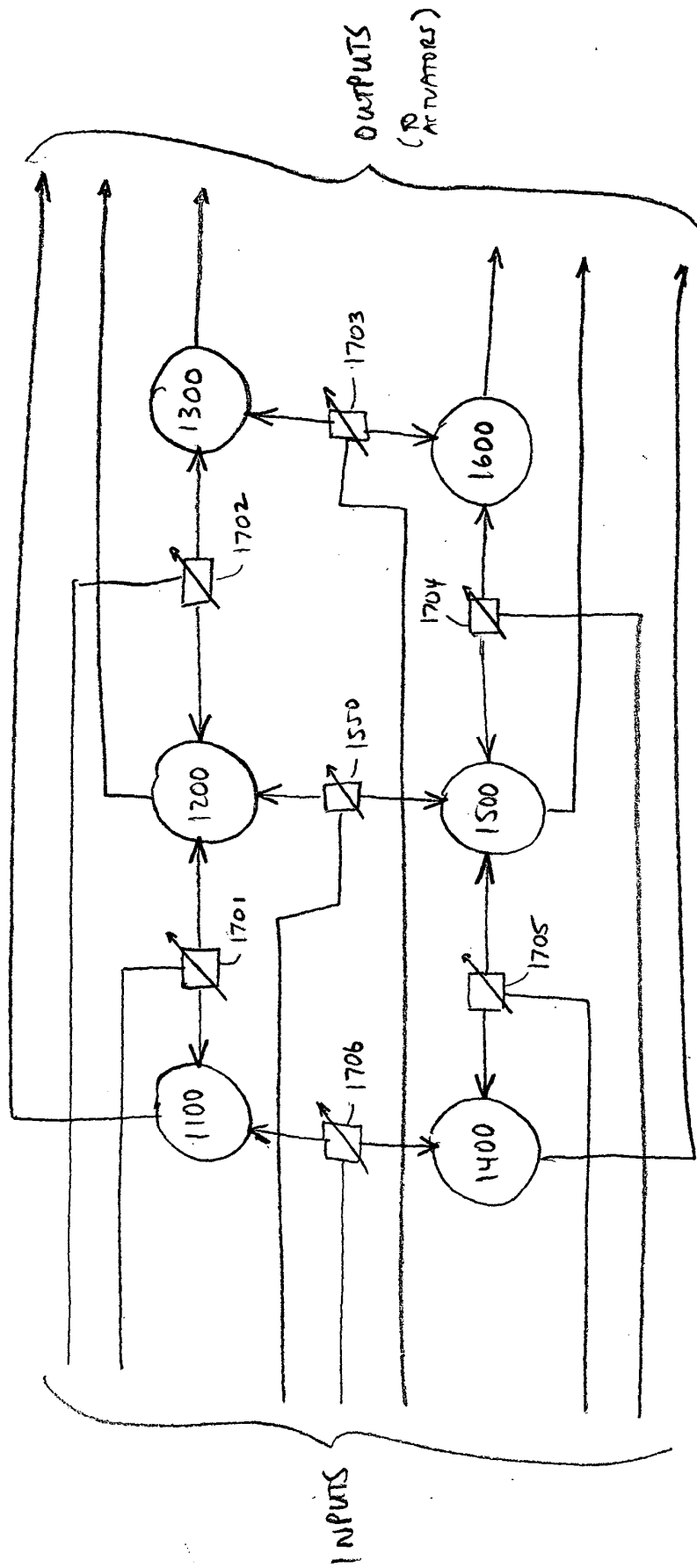


Fig. 15

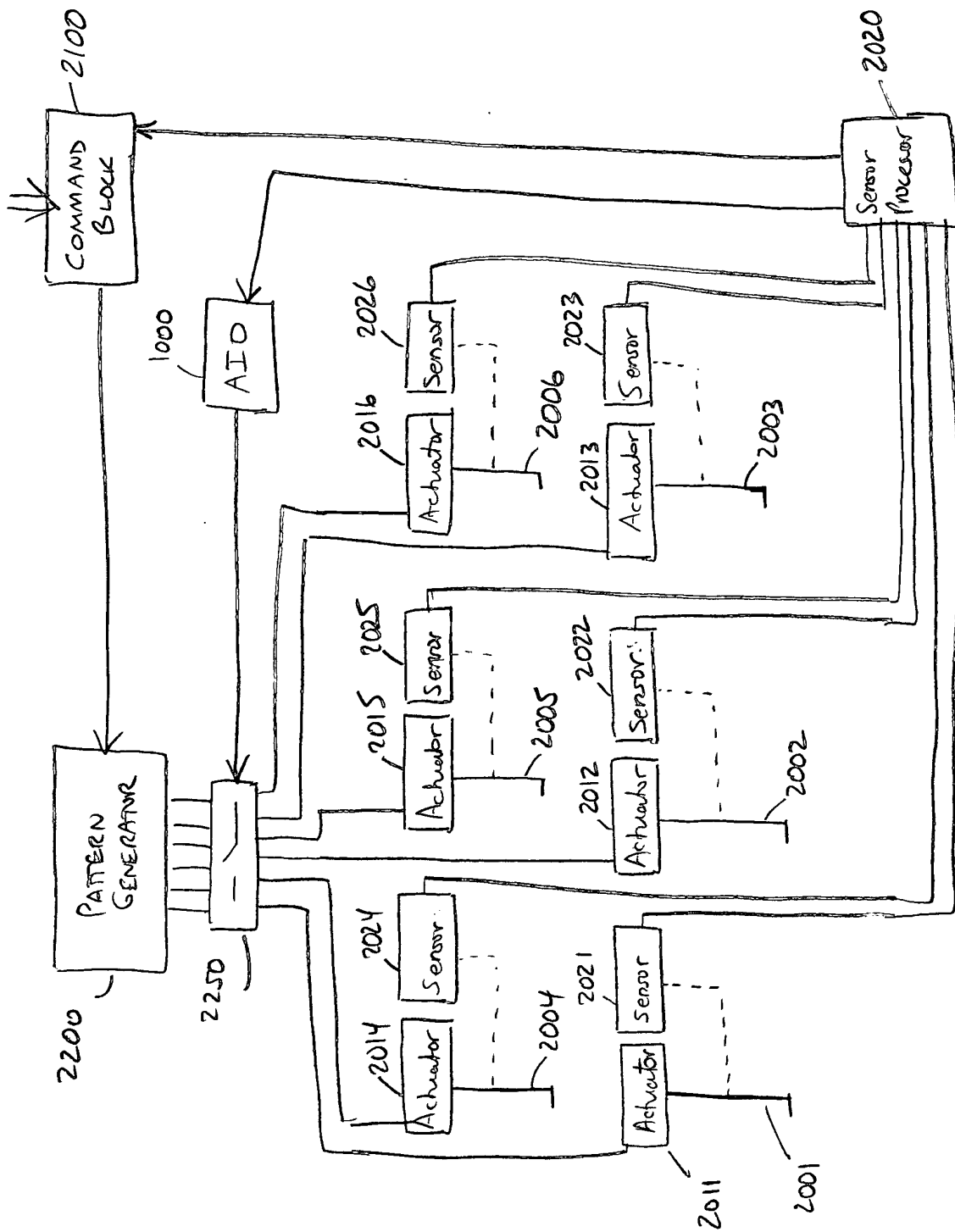


FIG. 16

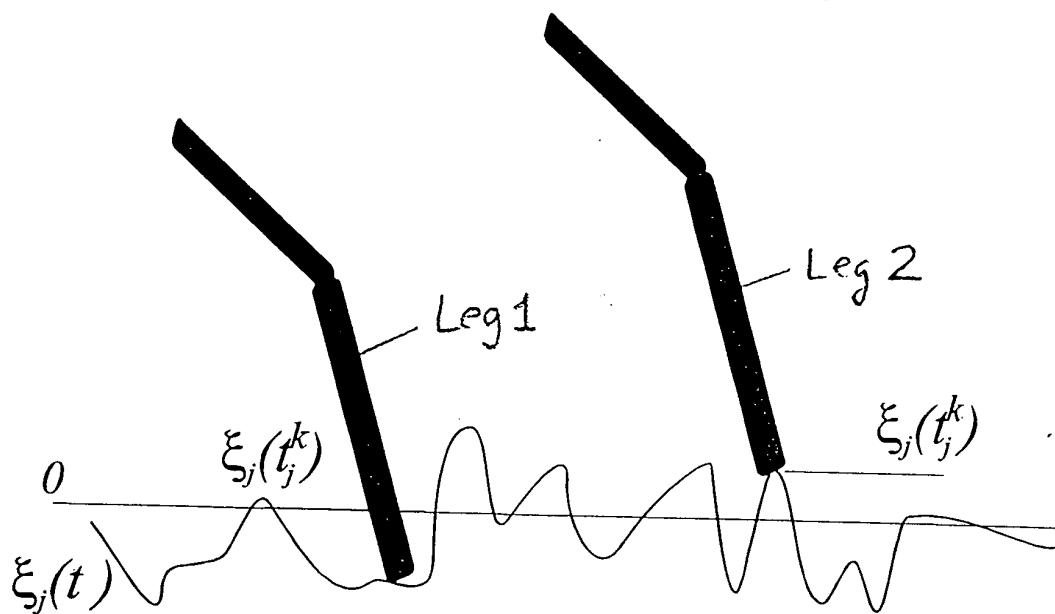
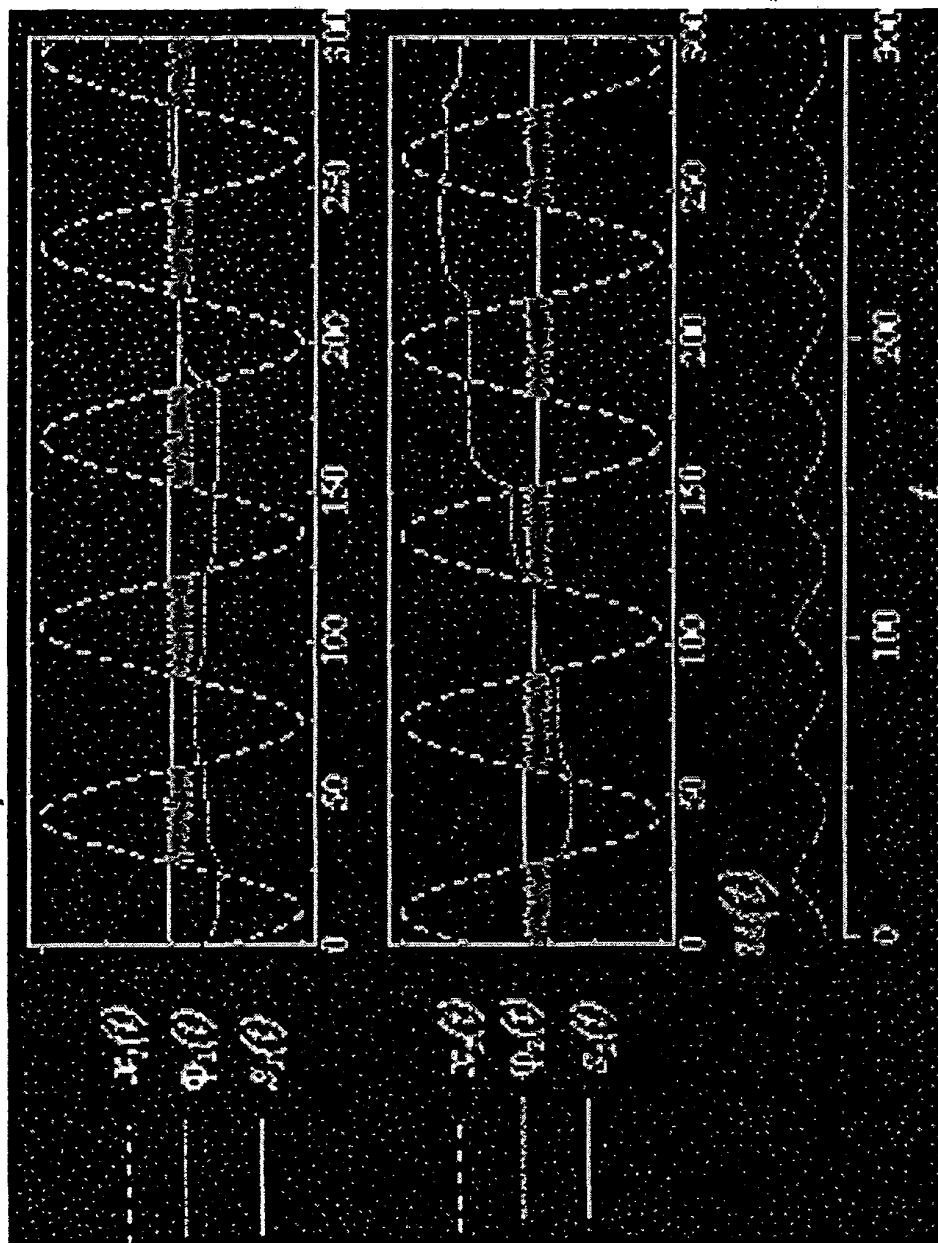


FIG. 17

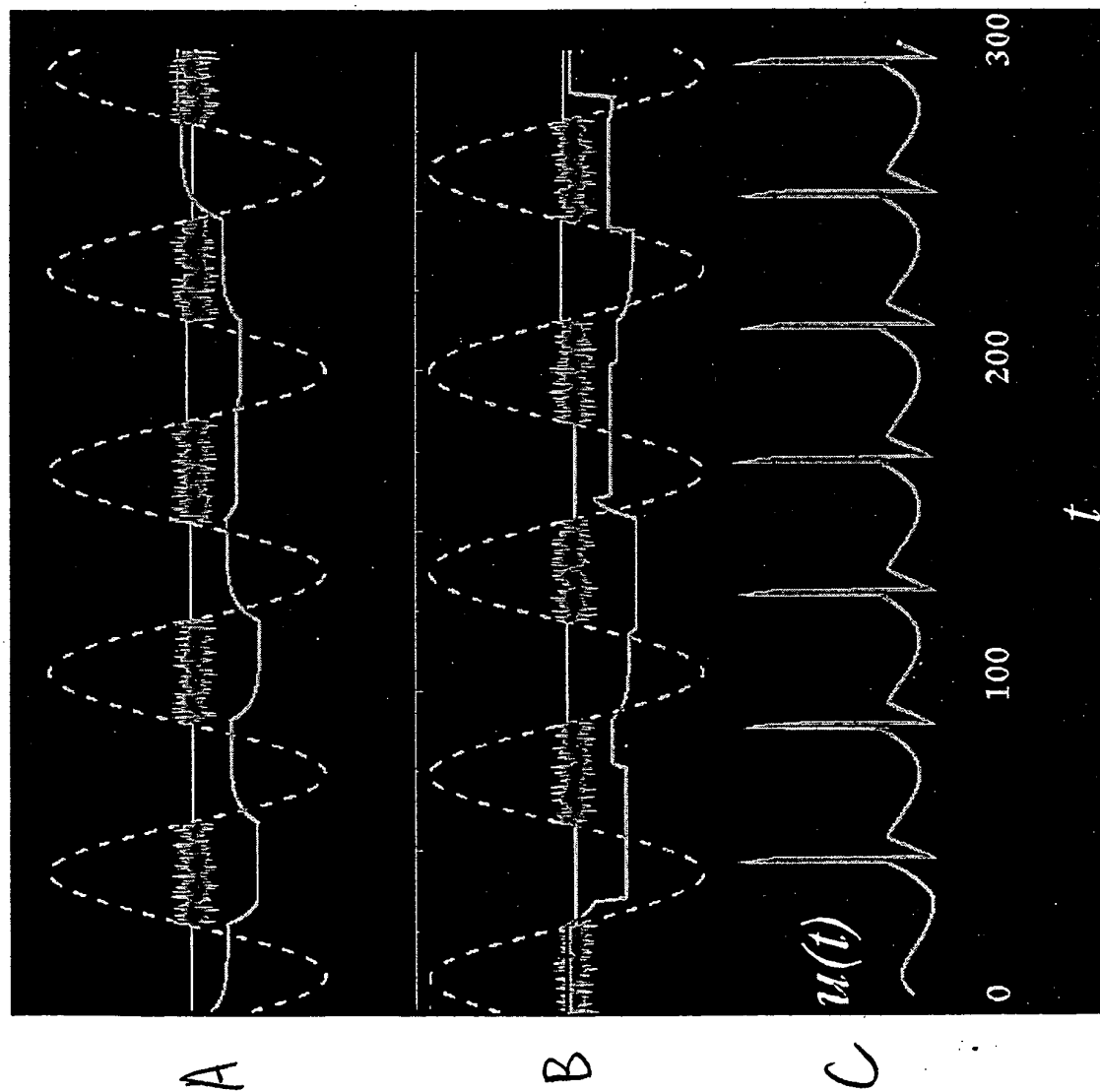
Global phase coordination



No control

FIG.18

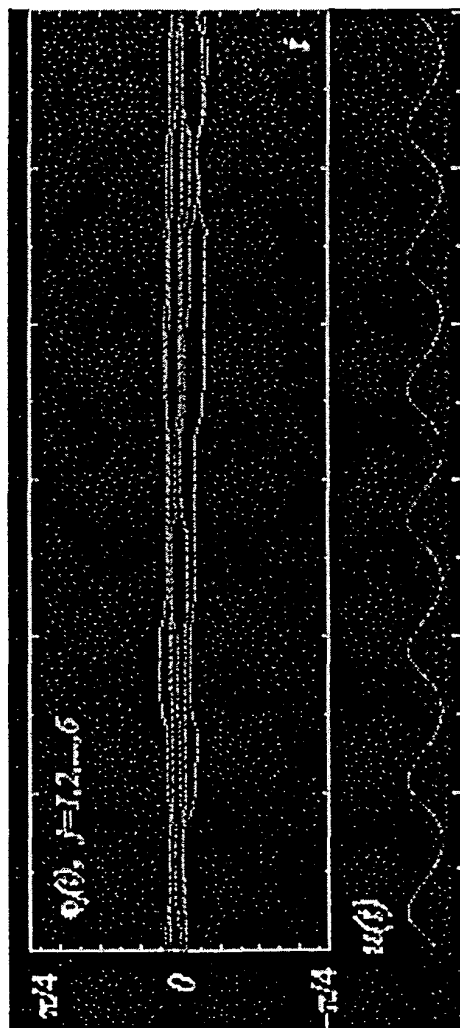
Coordination with discrete control



The control signal recovers
the correct phase shift
relations

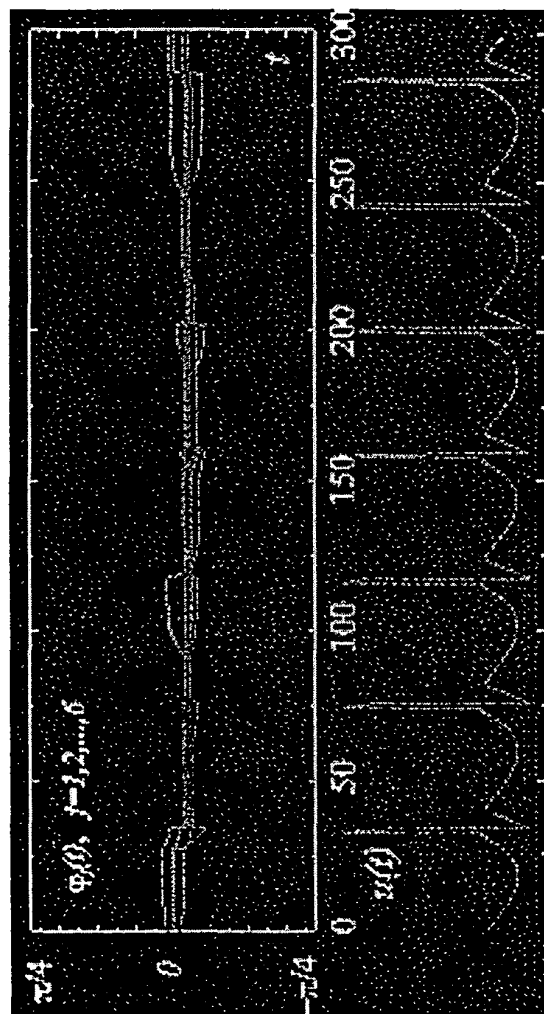
FIG. 19

Evolution of phases



A

No control – phases evolve according to self-tuning mechanisms



B

Discrete control – the movement is controlled to sustain the walking gate

FIG. 20

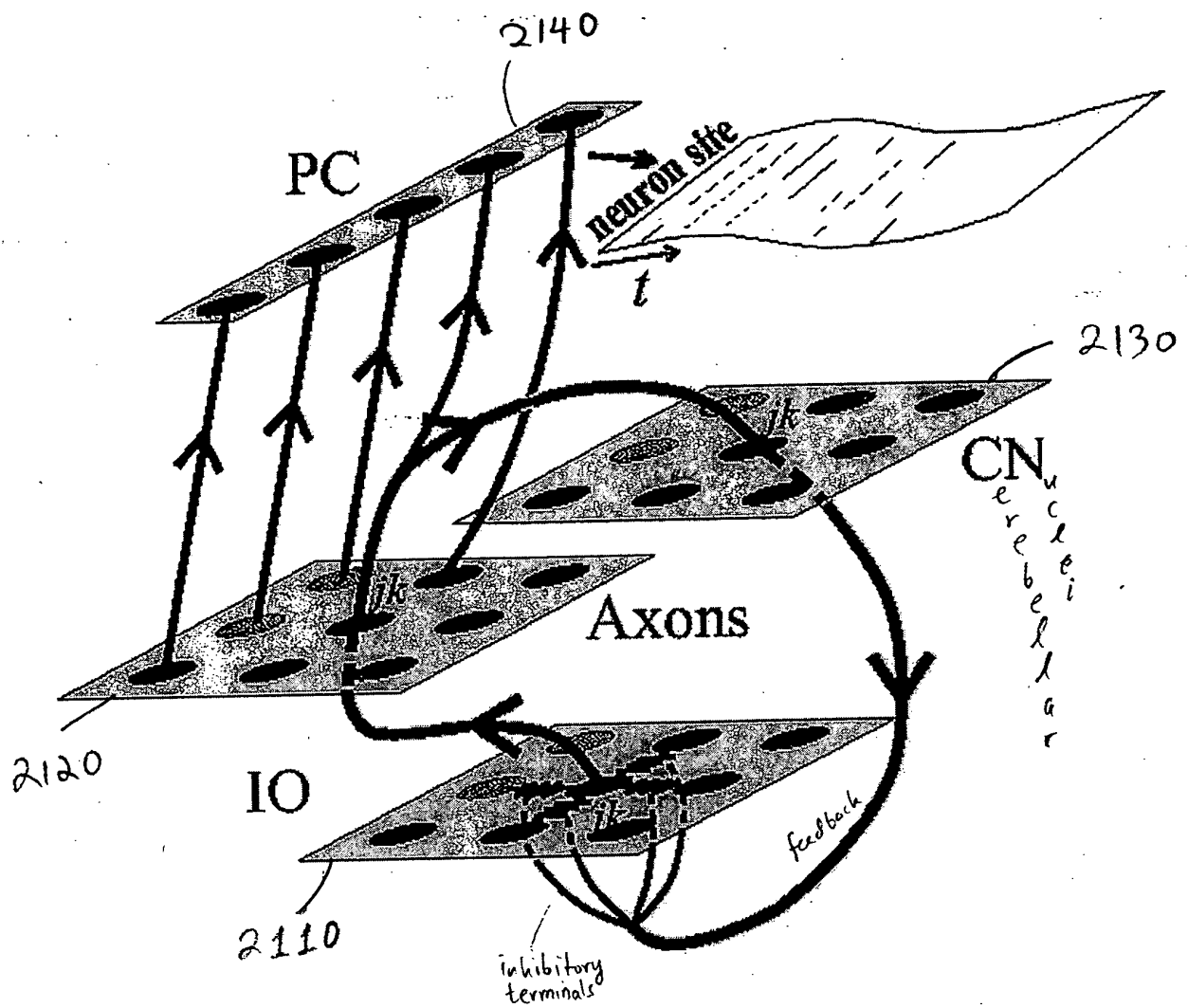


Figure 21

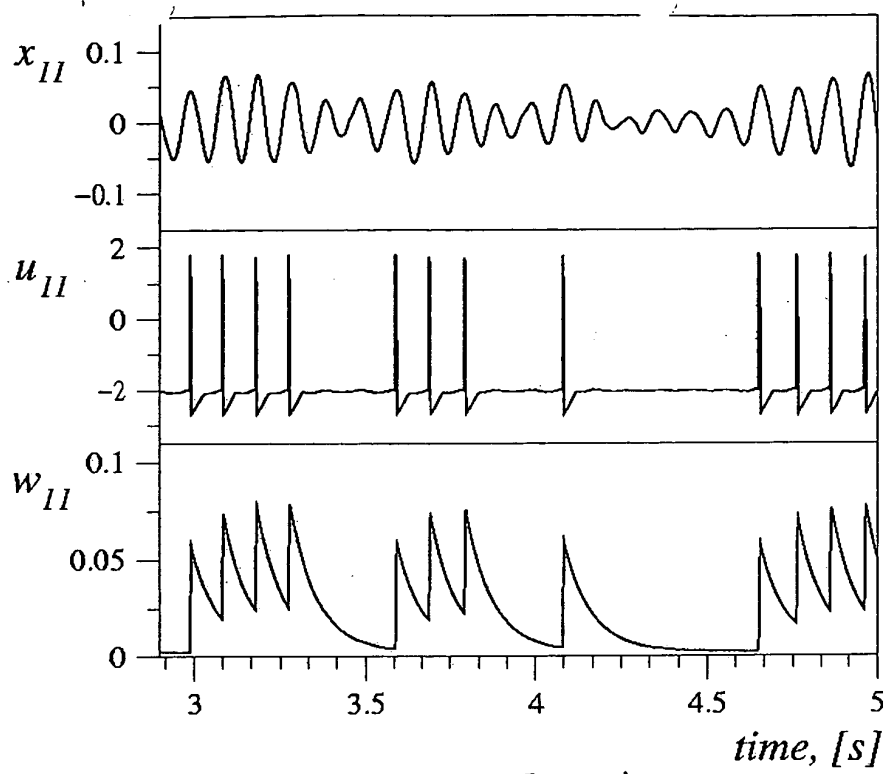


FIG.22A

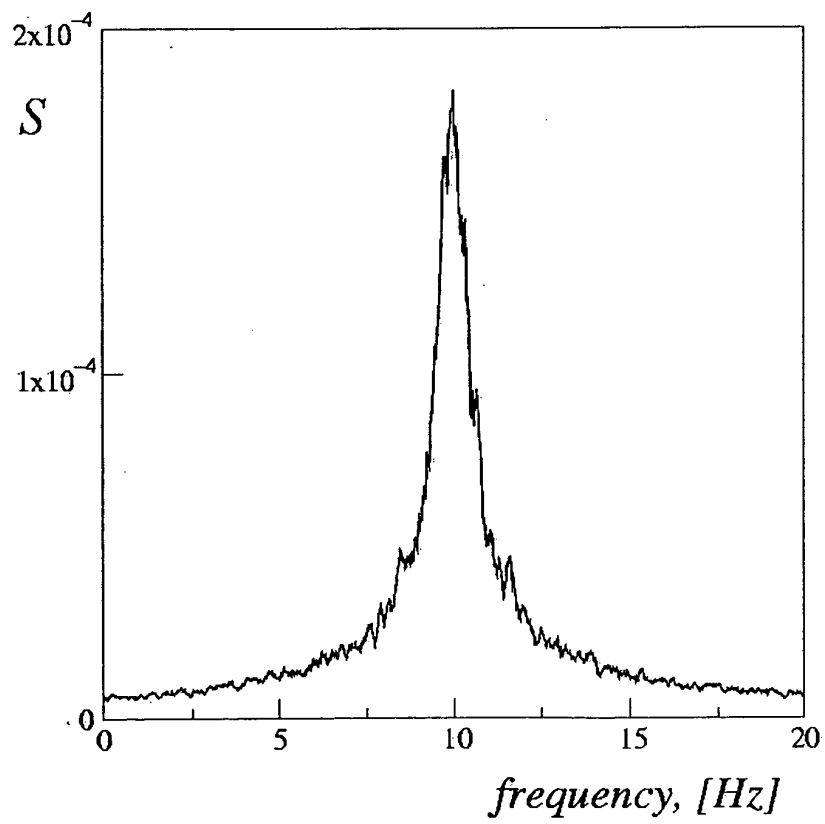


FIG.22B

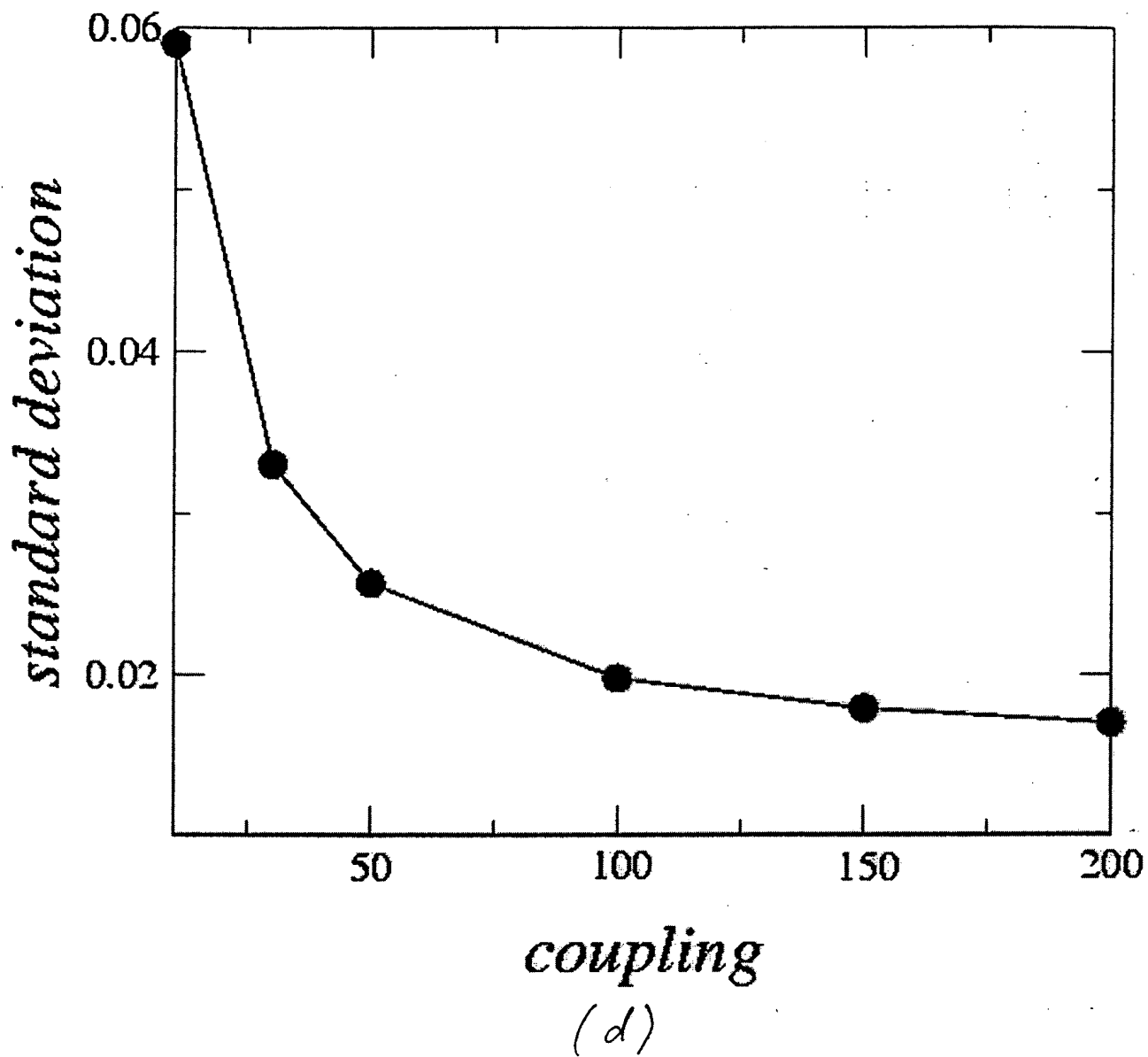
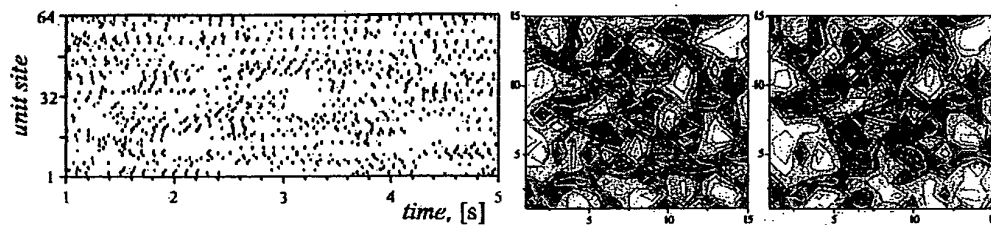
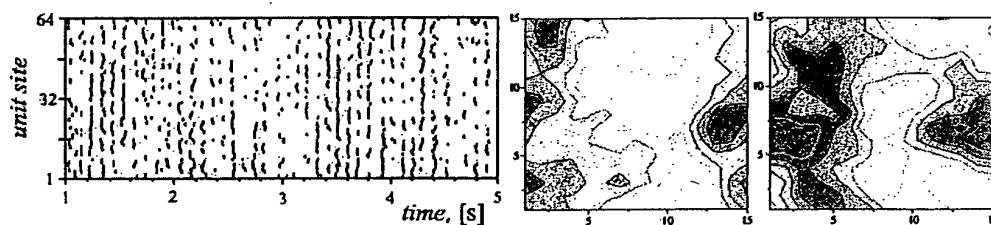


Figure 23



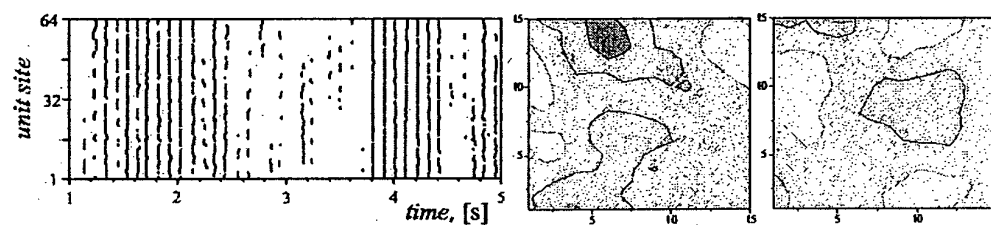
$d = 0$

(a)



$d = 50$

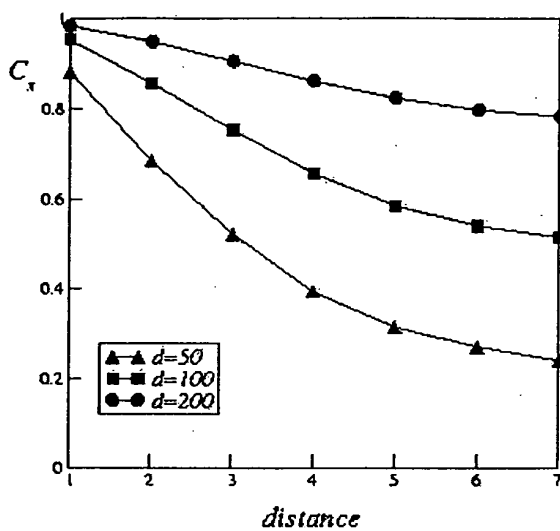
(b)



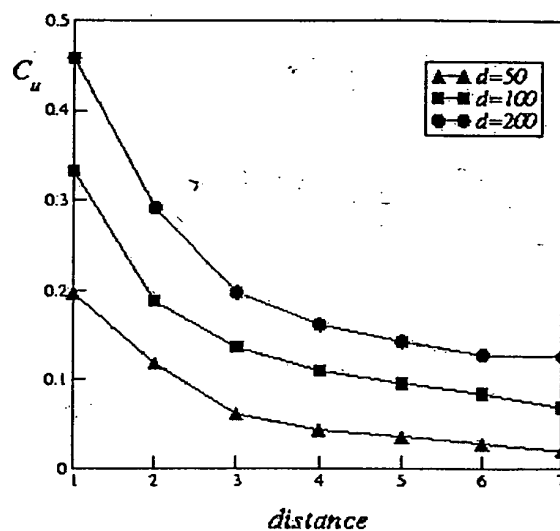
$d = 200$

(c)

Figure 24



(a)



(b)

Figure 25

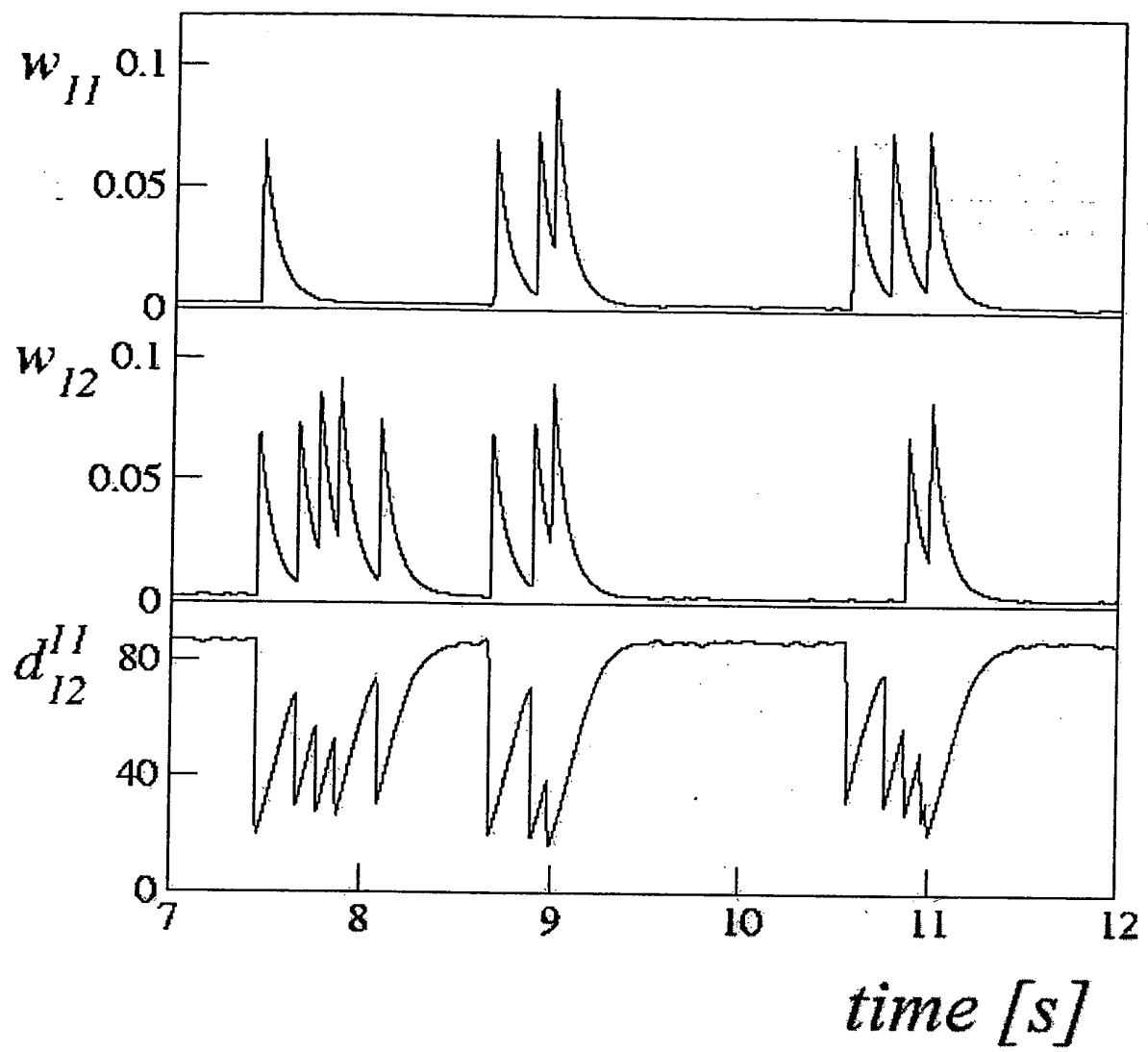
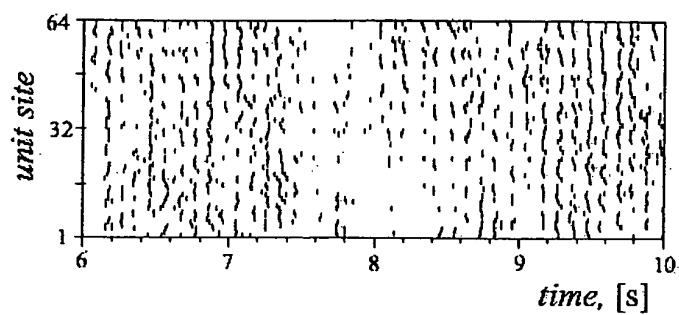
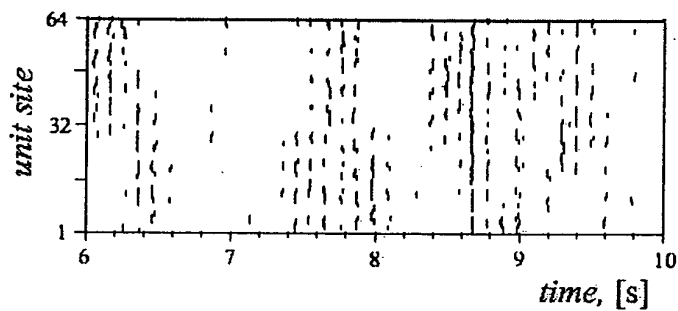


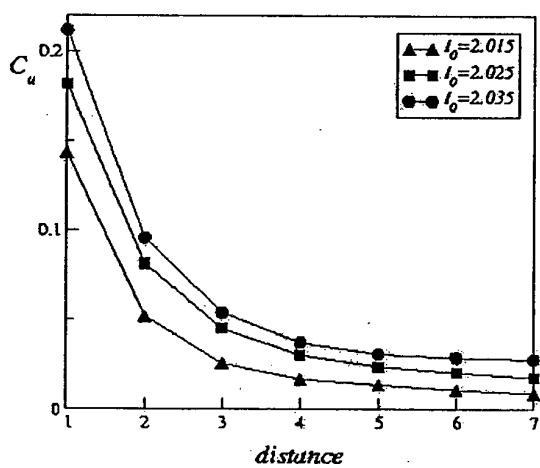
Figure 26



(a)

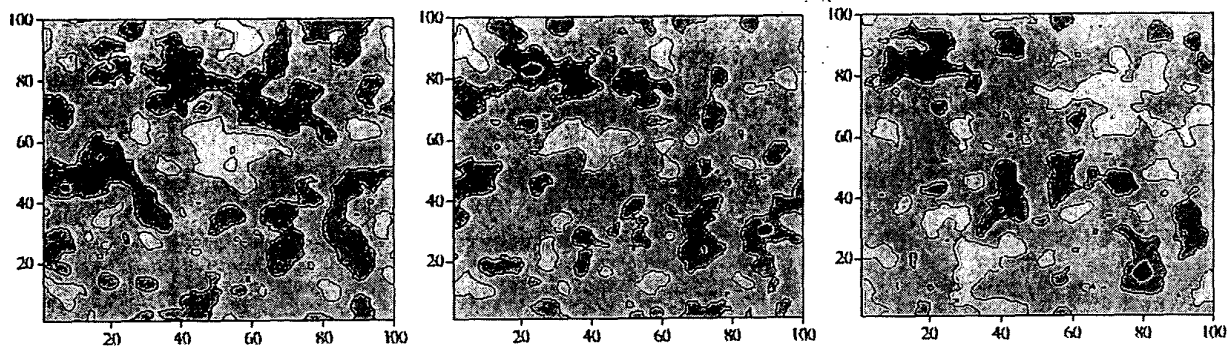


(b)



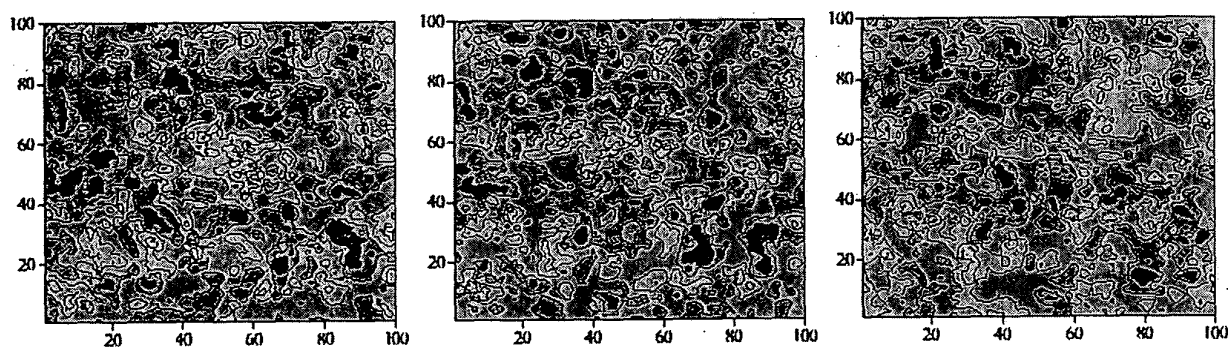
(c)

Figure 27



- constant
coupling
- no feedback
($\Gamma = 0$)

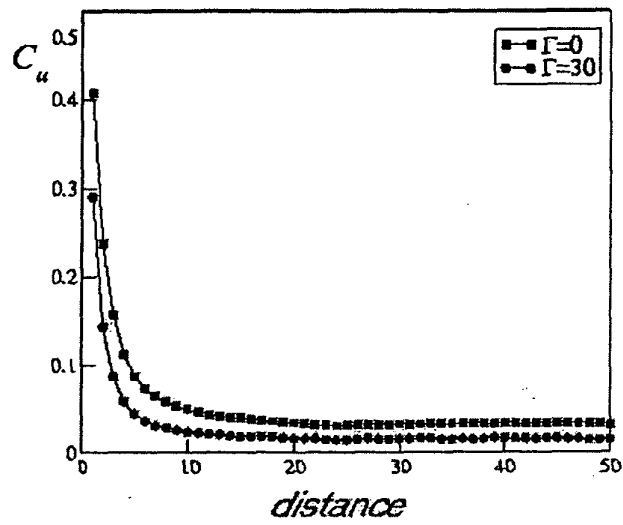
(a)



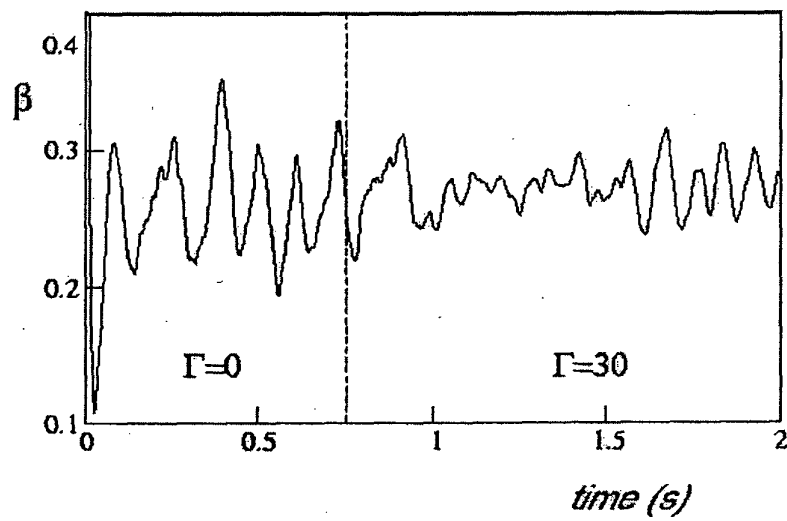
feedback
 $\Gamma \neq 0$

(b)

Figure 28



(a)



(b)

Figure 29

FIG. 30A

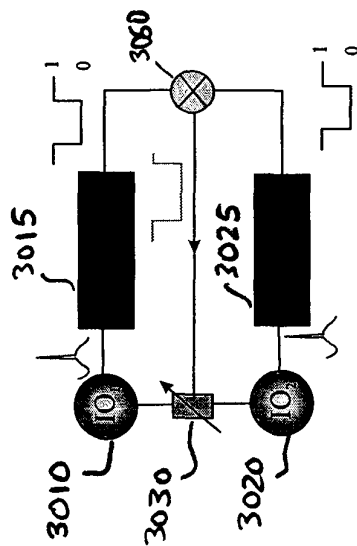


FIG. 30B

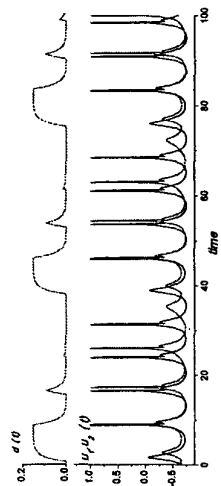


FIG. 31A

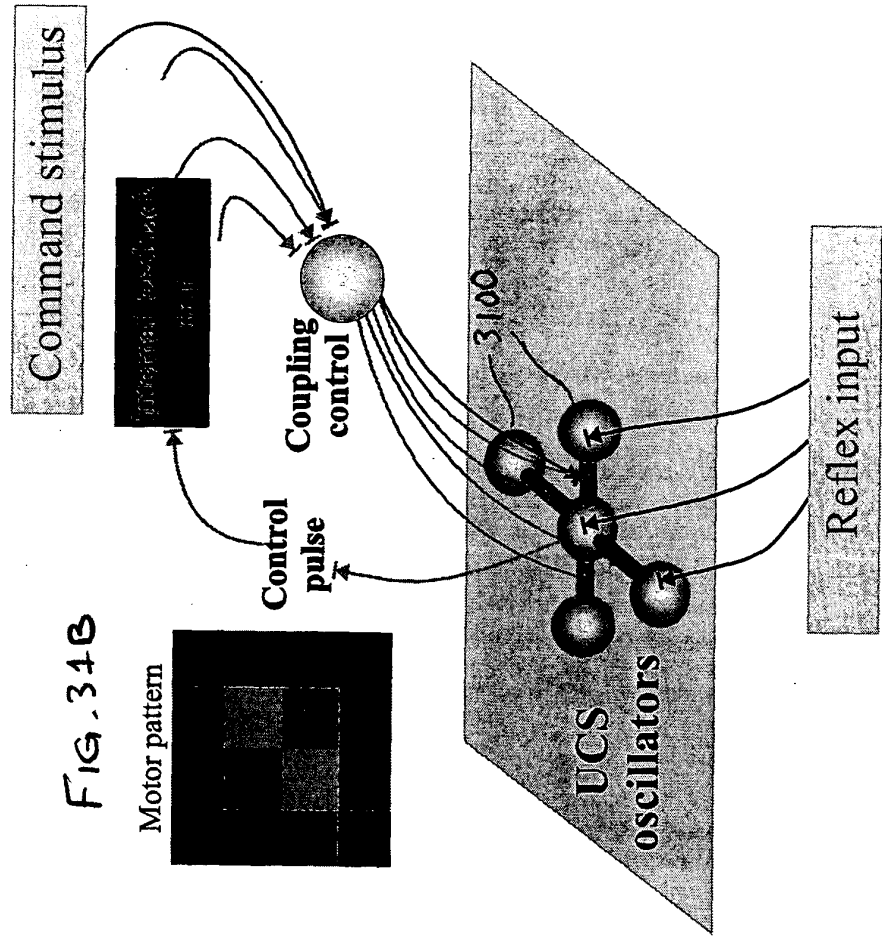


FIG. 31B

FIG. 32A

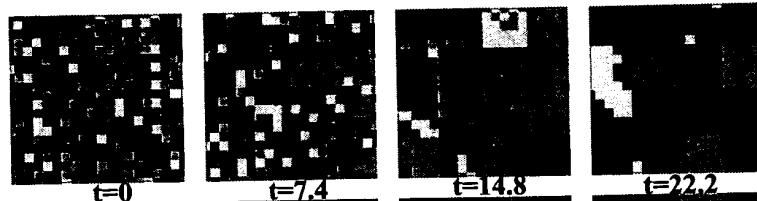


FIG. 32B

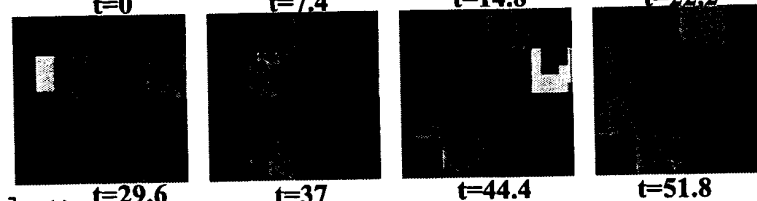


FIG. 32C

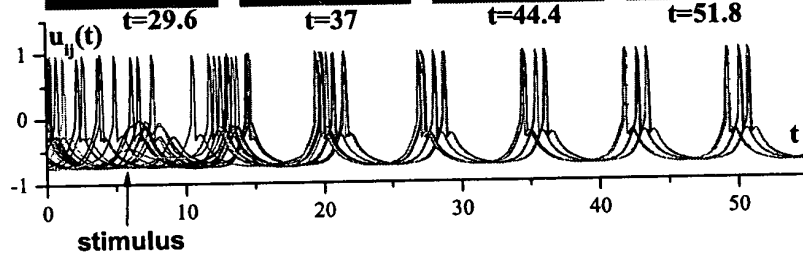


FIG. 33A

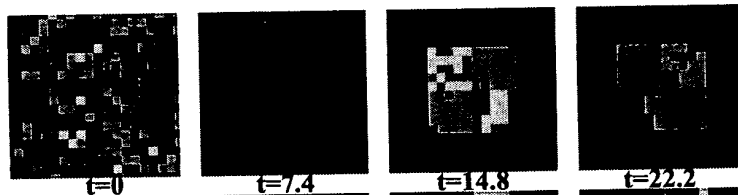


FIG. 33B

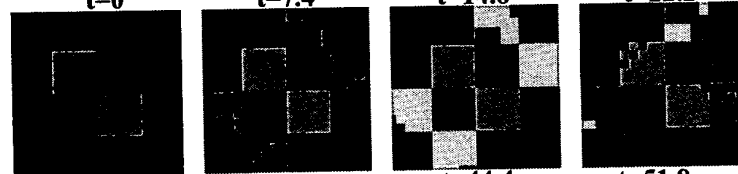


FIG. 33C

